In the Claims

[0072] 1.**(currently amended)** An MRI coil apparatus comprising:

four members, each member including a superconducting layer, where the members are arranged to form a closed shape having four overlapping regions, and

separating dielectric layers interposed between the superconducting layers at the overlapping regions to form built-in capacitors.

[0073] 2.**(original)** The apparatus of claim 1, wherein each member comprises a substrate dielectric layer upon which the superconducting layer was formed.

[0074] 3.**(original)** The apparatus of claim 2, wherein the substrate dielectric layers are rigid.

[0075] 4.**(original)** The apparatus of claim 2, wherein two of the substrate dielectric layers are rigid and two of the substrate dielectric layers are flexible.

[0076] 5.**(currently amended)** The apparatus of ~~any of the preceding claims~~ claim 1, wherein the members are straight.

[0077] 6.**(currently amended)** The apparatus of claims 1~~, 2, 3, or 4~~, wherein two of the members are straight and two of the members are curvilinear.

[0078] 7.**(currently amended)** The apparatus of claims 1~~, 2, 3, or 4~~, wherein two of the members are straight and two of the members are arcuate.

[0079] 8.**(currently amended)** The apparatus of ~~any of the preceding claims~~ claim 1, wherein the substrate dielectric layers are the separating dielectric layers.

[0080] 9.**(currently amended)** The apparatus of ~~any of the preceding claims~~ claim 1, further comprising:

a metal layer formed on an exposed portion of a dielectric layer or an external dielectric layer formed form on an exposed portion of a superconducting layer with a metal layer formed on the outer

surface of the external dielectric layer to form coupling or decoupling capacitive elements.

[0081] 10.(**original**) The apparatus of claim 9, further comprising:

wires bonded to the metal layers, where the metal wires are adapted to link a plurality of the apparatus together to form arrays or to connect the apparatus to a pre-amplifier.

[0082] 11.(**original**) A hybrid MRI coil apparatus comprising:

two superconducting members, each member including a superconducting layer,

two metal member, and

separating dielectric layers,

where the superconducting members and the metal member are arranged to form a closed shape having four overlapping regions and the separating dielectric layers are interposed between the superconducting layers and the metal members at the overlapping regions to form built-in capacitors.

[0083] 12.(**original**) The apparatus of claim 11, wherein each superconducting member comprises a substrate dielectric layer upon which the superconducting layer was formed.

[0084] 13.(**original**) The apparatus of claim 12, wherein the substrate dielectric layers are rigid.

[0085] 14.(**original**) The apparatus of claim12, wherein two of the substrate dielectric layers are rigid and two of the substrate dielectric layers are flexible.

[0086] 15.(**currently amended**) The apparatus of claims 11~~, 12, 13, or 14~~ wherein the superconducting members are straight.

[0087] 16.(**currently amended**) The apparatus of claims 11, ~~12, 13, or 14,~~ wherein the superconducting members are curvilinear.

[0088] 17.(**currently amended**) The apparatus of claims 11, ~~12, 13, or 14,~~ wherein superconducting members are arcuate.

[0089] 18.(**currently amended**) The apparatus of claims 11, ~~12, 13, 14, 15, 16 or 17,~~ wherein the substrate dielectric layers are the separating dielectric layers.

[0090] 19.(**currently amended**) The apparatus of 11, ~~12, 13, 14, 15, 16 17 or 18,~~ further comprising:

a metal layer formed on an exposed portion of a dielectric layer or a external dielectric layer formed form on an exposed portion of a superconducting layer with a metal layer formed on the outer surface of the external dielectric layer to form coupling or decoupling capacitive elements.

[0091] 20.(**original**) The apparatus of claim 19, further comprising:

wires bonded to the metal layers, where the metal wires are adapted to link a plurality of the apparatus together to form arrays or to connect the apparatus to a pre-amplifier.

[0092] 21.(**original**) A birdcage-type resonator apparatus comprising:

a plurality of coils apparatus including:

four members, each member including a superconducting layer, where the members arranged to form a closed shape having four overlapping regions, and

separating dielectric layers interposed between the superconducting layers at the overlapping regions to form built-in capacitors, and

at least one small animal cavity,

where the coil apparatus are arranged around the cavity to permit MRI imaging of an animal placed within the cavity.

[0093] 22.(**original**) The apparatus of claim 21, wherein each member comprises a substrate dielectric layer upon which the superconducting layer was formed.

[0094] 23.(**original**) The apparatus of claim 22, wherein the substrate dielectric layers are rigid.

[0095] 24.(**original**) The apparatus of claim 22, wherein two of the substrate dielectric layers are rigid and two of the substrate dielectric layers are flexible.

[0096] 25.(**currently amended**) The apparatus of 21, ~~22, 23 or 24,~~ wherein the members are straight.

[0097] 26.(**currently amended**) The apparatus of claims 21, ~~22, 23, or 24,~~ wherein two of the members are straight and two of the members are curvilinear.

[0098] 27.(**currently amended**) The apparatus of claims 21, ~~22, 23, or 24,~~ wherein two of the members are straight and two of the members are arcuate.

[0099] 28.(**currently amended**) The apparatus of claims 21, ~~22, 23, 24, 25, 26 or 27,~~ wherein the substrate dielectric layers are the separating dielectric layers.

[0100] 29.(**currently amended**) The apparatus of claims 21, ~~22, 23, 24, 25, 26, 27 or 28,~~ further comprising:

a metal layer formed on an exposed portion of a dielectric layer or a external dielectric layer formed form on an exposed portion of a superconducting layer with a metal layer formed on the outer surface of the external dielectric layer to form coupling or decoupling capacitive elements.

[0101] 30.(**original**) The apparatus of claim 29, further comprising:

wires bonded to the metal layers, where the metal wires are adapted to link a plurality of the apparatus together to form arrays or to connect the apparatus to a pre-amplifier.

[0102] 31.(**original**) A birdcage-type resonator apparatus comprising:

a plurality of coils apparatus including:

two superconducting members, each member including a superconducting layer,

two metal member, and

separating dielectric layers, and

at least one small animal cavity,

where the coil apparatus are arranged around the cavity to permit MRI imaging of an animal placed within the cavity and where the superconducting members and the metal member are arranged to form a closed shape having four overlapping regions and the separating dielectric layers are

interposed between the superconducting layers and the metal members at the overlapping regions to form built-in capacitors.

[0103] 32.**(original)** The apparatus of claim 31, wherein each superconducting member comprises a substrate dielectric layer upon which the superconducting layer was formed.

[0104] 33.**(original)** The apparatus of claim 32, wherein the substrate dielectric layers are rigid.

[0105] 34.**(original)** The apparatus of claim32, wherein two of the substrate dielectric layers are rigid and two of the substrate dielectric layers are flexible.

[0106] 35.**(currently amended)** The apparatus of claims 31, ~~32, 33, or 34~~ wherein the superconducting members are straight.

[0107] 36.**(currently amended)** The apparatus of claims 31, ~~32, 33, or 34,~~ wherein the superconducting members are curvilinear.

[0108] 37.**(currently amended)** The apparatus of claims 31, ~~32, 33, or 34,~~ wherein superconducting members are arcuate.

[0109] 38.**(currently amended)** The apparatus of claims 31, ~~32, 33, 34, 35, 36 or 37,~~ wherein the substrate dielectric layers are the separating dielectric layers.

[0110] 39.**(currently amended)** The apparatus of 31, ~~32, 33, 34, 35, 36 37 or 38,~~ further comprising:

a metal layer formed on an exposed portion of a dielectric layer or a external dielectric layer formed form on an exposed portion of a superconducting layer with a metal layer formed on the outer surface of the external dielectric layer to form coupling or decoupling capacitive elements.

[0111] 40.**(original)** The apparatus of claim 39, further comprising:

wires bonded to the metal layers, where the metal wires are adapted to link a plurality of the

apparatus together to form arrays or to connect the apparatus to a pre-amplifier.

[0112] 41.(**currently amended**) A small animal MRI apparatus comprising:

a vacuum housing including at least one cylindrical cavity adapted to receive a small animal,

a coolant reservoir including a coolant, a coolant inlet, a coolant outlet and a cold plate forming an internal end of the reservoir,

a resonator ~~of claims 21-40~~ surrounding each cavity ~~or a plurality of coils of claims 1-20 positioned within the housing~~ to permit MRI imaging of an animal in each of the cavities, where the resonator comprises:

a plurality of coils apparatus including:

four members, each member including a superconducting layer, where the members arranged to form a closed shape having four overlapping regions, and

separating dielectric layers interposed between the superconducting layers at the overlapping regions to form built-in capacitors, and

at least one small animal cavity,

where the coil apparatus are arranged around the cavity to permit MRI imaging of an animal placed within the cavity.

[0113] 42.(**new**) A small animal MRI apparatus comprising:

a vacuum housing including at least one cylindrical cavity adapted to receive a small animal,

a coolant reservoir including a coolant, a coolant inlet, a coolant outlet and a cold plate forming an internal end of the reservoir,

a plurality of coils positioned within the housing to permit MRI imaging of an animal in each of the cavities, where the each coil comprises:

four members, each member including a superconducting layer, where the members are arranged to form a closed shape having four overlapping regions, and

separating dielectric layers interposed between the superconducting layers at the overlapping regions to form built-in capacitors.